



THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS

Appellants:	V. I. Roman	APPEAL BRIEF
Serial No.	09/183,715	
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Examiner	C. Tran	
Attorney Docket No.	100.104US01 (formally 500.709US01)	
Title: USING ALTERNATE POLARIZATION IN FIXED WIRELESS SYSTEM DEPLOYMENT FOR IMPROVED CAPACITY		

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1. Introduction

On September 17, 2003, Appellants filed a notice of appeal from the final rejection of claims 1-69 set forth in the Final Office Action mailed June 18, 2003. Three copies of this Appeal Brief are hereby timely filed on December 17, 2003, and are accompanied by a fee in the amount of \$330.00 as required under 37 C.F.R. §1.17(c).

2. Real Party in Interest

The real party in interest in the above-captioned application is the assignee ADC Telecommunication Inc.

3. Related Appeals and Interferences

There are no other appeals or interferences known to Appellants that will have a bearing on the Board's decision in the present appeal.

4. Status of the Claims

Claims 1-69 are pending in the application. Claims 1-69 are subject of this appeal. In a Final Office Action mailed June 18, 2003, Claims 1-69 were rejected under 35 U.S.C. §102(e).

5. Summary of the Amendments

No amendments have been made after the Final Office action.

6. Summary of the Invention

In one embodiment, a communication system is provided. The communication system includes a number of communication circuits (e.g., 110, 120, 130) disposed to divide a region (100) into communication areas (e.g., 140, 150, 160). Specification, p. 4, lines 17-28. Each communication circuit communicates using a first polarization in a first portion (e.g., 260, 230, 220) of its communication area (e.g., 140, 150, 160) and

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communicates using a second, different polarization in a second portion (e.g., 250, 240, 210) of its communication area. Specification, p. 5, lines 4-13. Adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization to form substantially linear communication regions (e.g., 430, 440, 450, 460) of the same polarization. Specification, p. 7, lines 10-14.

In another embodiment, a communication system is provided. The system includes a number of communication circuits (e.g., 110, 120, 130) disposed to form substantially linear boundaries between communication regions (e.g., 430, 440, 450, 460). Specification, p. 7, lines 10-14. The communication circuits use a first polarization in one of the communication regions and a second, different polarization for signals communicated in communication regions adjacent to the one of the communication regions. Specification, p. 7, lines 15-23.

In another embodiment, a method for dividing a region into a number of communication areas (e.g., 140, 150, 160) is provided. Each communication area includes a communication circuit (e.g., 110, 120, 130). The method further includes communicating using a first polarization in a first portion (e.g., 260, 230, 220) of each communication area. Further, a second polarization is used for communicating in a second portion of each communication area (e.g., 250, 240, 210). Specification, p. 5, lines 4-13. Adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization to form communication region belts (e.g., 430, 440, 450, 460) having the same polarization. Specification, p. 7, lines 15-23.

In yet another embodiment, a communication system comprising a number of communication circuits (e.g., 110, 120, 130) disposed to divide a region (100) into communication areas (e.g., 140, 150, 160) is provided. Each communication circuit communicates using a first polarization in a first portion (e.g., 260, 230, 220) of its communication area and communicates using a second, different polarization in a second portion (e.g., 250, 240, 210) of its communication area. Adjacent first portions

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of communication areas for a plurality of communication circuits use the same polarization to form communication region strips (e.g., 430, 440, 450, 460) of the same polarization.

In yet a further embodiment, a method is provided. The method includes forming boundaries between bands (e.g., 430, 440, 450, 460) of communication regions by disposing a number of communication circuits (e.g., 110, 120, 130) and communicating using a first polarization in a first band (e.g., 440). Further, the method includes communicating using a second polarization in bands (e.g., 430 and 450) that are adjacent to the first band.

In a further embodiment, a method is provided. The method includes forming a number of communication areas (e.g., 140, 150, 160), each communication area including a communication circuit (e.g., 110, 120, 130). Each communication circuit communicates using a first polarization in a first portion (e.g., 260, 230, 220) of each communication area and a second polarization in a second portion (e.g., 250, 240, 210) of each communication area. The method further includes forming a number of communication regions in belts (e.g., 430, 440, 450, 460) of either the first or second polarization wherein adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization. Further, the method includes forming a number of sectors (e.g., 310, 320, 330, 340) within each communication area, where the first and second portions of the communication area are divided along a number of boundaries of the sectors, each sector communicating on a different subband of a frequency spectrum. Specification, p. 6 line 7 - p. 7, line 9.

In a further embodiment, a communication system is provided. The system includes a first plurality of communication circuits (e.g., the row with communication circuit 120) disposed in a first row. The system further includes a second plurality of communication circuits disposed in at least one additional row (e.g., the row with communication circuit 110 or 130). The first plurality of communication circuits and the second plurality of communication circuits use a first polarization between the first

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row and at least one additional row. The first plurality of communication circuits and the second plurality of communication circuits use a second, different polarization for communications not between the first and at least one additional rows.

In yet another embodiment, a communication system is provided. The system includes a number of communication circuits (e.g., 110, 120, 130) disposed along a boundary between first and second substantially linear communication regions (e.g., 430, 440, 450, 460). Each communication circuit communicates with a first polarization in the first communication region on one side of the boundary and a second, different polarization in the second communication region on the other side of the boundary.

In yet another embodiment, a method is provided. The method includes disposing a plurality of communication circuits (e.g., 110, 120, 130) on a boundary between first and second regions (e.g., 430, 440, 450, 460), configuring each of the plurality of communication circuits to communicate using a first polarization in the first region, and configuring each of the plurality of communication circuits to communicate using a second, different polarization in the second region.

In yet another embodiment, a method is provided. The method includes disposing a first plurality of communication circuits (e.g., the row with communication circuit 120) in a first row, disposing a second plurality of communication circuits in at least one additional row (e.g., the row with communication circuit 110 or 130), configuring the first plurality of communication circuits and the second plurality of communication circuits to use a first polarization between the first row and the at least one additional row, and configuring the first plurality of communication circuits and the second plurality of communication circuits to use a second, different polarization for communications not between the first and at least one additional rows.

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7. Issues Presented for Review

The questions presented in this Appeal is whether the Examiner erred in rejecting Claims 1-69 under 35 U.S.C. §102(e) as being anticipated by Shohara (U.S. Patent No. 6,301,482).

8. Grouping of Claims

Although, each of claims 1-69 stand or fall on their own merits, Applicant has focused this appeal mainly on the 35 U.S.C. §102(e) rejections of independent claims 1, 12, 21, 46, 31, 40, 55, 60, 65, and 69 as being anticipated by Shohara (U.s. Patent No. 6,301,482). The rejection of claims 2-11, 13-20, 22-30, 32-39, 41-45, 47-54, 56-59, 61-64, and 66-68 as being anticipated by Shohara is also briefly addressed.

9. Argument

A. The Applicable Law

35 USC§ 102 provides in relevant part that:

A person shall be entitled to a patent unless —

(e) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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A claim is anticipated under 35 U.S.C. § 102 only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but identical terminology is not required. *In re Bond*, 910 F. 2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990).

Anticipation focuses on whether a claim reads on a product or process disclosed in a prior art reference, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter. *PPG Industries, Inc. v. Guardian Industries Corp.*, 75 F.3d 1558, 37 U.S.P.Q.2d 1618 (Fed. Cir. 1996).

B. Analysis of the rejections under 35 U.S.C. §102(e)

The Examiner finally rejected Claims 1-69 under 35 USC §102(e) as being anticipated by Shohara (U.S. Patent No. 6,301,482). Applicant respectfully traverses the rejection. The rejection of each claim is addressed in turn below.

i. Claims 1-11

Claim 1 is directed to a communication system. The communication system includes a number of communication circuits disposed to divide a region into communication areas. Each communication circuit communicates using a first polarization in a first portion of its communication area and communicates using a second, different polarization in a second portion of its communication area. Adjacent first portions of communication areas for a plurality of different communication circuits

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use the same polarization to form substantially linear communication regions of the same polarization.

In rejecting claim 1, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion, comprising a number of communication circuits disposed to divided a region into communication areas (Figure 1, elements 2, and its description); wherein each communication circuit communicates using a first polarization in a first portion of its communication area and communicates using a second, different polarization in a second portion of its communication area (Figure 5, elements H1 horizontal polarization, V2 vertical polarization, and its description); and wherein adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization to form communication regions of same polarization (Figure 5, elements 1b, 2c, and its description).

Final Office Action, p. 4.

Applicant respectfully disagrees with the Examiner's application of the claim to Shohara. Shohara does not teach or suggest the system of claim 1. Shohara does not teach or suggest "adjacent first portions of communication areas for a *plurality* of different communication circuits [using] the same polarization to form substantially linear communication regions of the same polarization." (Emphasis added). At most, Shohara shows two adjacent sectors that use the same polarization. This is far short of the "substantially linear communication regions" formed by a *plurality* of communication circuits as shown in Figure 1 and as called for in claim 1. In *Webster's New Collegiate Dictionary* (G. & C. Merriam Co., 1981), plurality is defined as "the state of being numerous" and "a large number or quantity." Under this definition, it is clear that Shohara does not teach or suggest "substantially linear communication regions" formed by a plurality of communication circuits. Therefore, claim 1 is neither anticipated nor obvious in light of Shohara.

Claims 2-11 depend from claim 1 and are thus likewise allowable.

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ii. Claims 12-20

Claim 12 is directed to a communication system. The system includes a number of communication circuits disposed to form substantially linear boundaries between communication regions. The communication circuits use a first polarization in one of the communication regions and a second, different polarization for signals communicated in communication regions adjacent to the one of the communication regions.

In rejecting claim 12, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion, comprising a number of communication circuits disposed to form substantial linear boundaries between communication areas (Figure 1, elements 2, Figure 5, 1b, 2c and its description); and wherein the communication circuits use a first polarization in one of the communication regions and a second, different polarizations for signals communicated in communication regions adjacent to the one of the communication regions (Figure 5, elements 1b, 2c, H horizontal polarization, V vertical polarization, and its description).

Final Office Action, p. 4.

Applicant respectfully disagrees with the Examiner's application of the claim to Shohara. Shohara does not teach or suggest the system of claim 12. Shohara does not teach or suggest communication circuits that are "disposed to form substantially linear boundaries between communication regions" in which the communication circuits "use a first polarization in one of the communication regions and a second, different polarization for signals communicated in communication regions adjacent to the one of the communication regions." Rather, in Shohara, both vertical and horizontal polarizations are used between any two rows of communication circuits. Therefore, claim 12 is neither anticipated nor obvious in light of Shohara.

Claims 13-20 depend from claim 12 and are thus likewise allowable.

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iii. Claims 21-30 and 46-54

The Examiner lumped the rejections of claims 21 and 46 together. Thus, these two claim sets are addressed together here.

Claim 21 is directed to a method for dividing a region into a number of communication areas, each communication area including a communication circuit. The method further includes communicating using a first polarization in a first portion of each communication area. Further, a second polarization is used for communicating in a second portion of each communication area. Adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization to form communication region belts having the same polarization.

Claim 46 is directed to a communication system comprising a number of communication circuits disposed to divide a region into communication areas. Each communication circuit communicates using a first polarization in a first portion of its communication area and communicates using a second, different polarization in a second portion of its communication area. Adjacent first portions of communication areas for a plurality of communication circuits use the same polarization to form communication region strips of the same polarization.

In rejecting claims 21 and 46, the Examiner stated:

Shohara discloses a DMA cellular radio system with a channel quality criterion, comprising dividing a region into a number of communication areas, each communication area including a communication circuit (Figure 1, elements 2, Figure 2 and its description); communicating using a first polarization in a first portion of each communication area (Figure 5, H1 horizontal polarization and its description); communicating using a second polarization in a second portion of each communication area (Figure 5, V1 vertical polarization and its description); and wherein adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization to form communication region belts having the same polarization (Figure 5, elements 1b, 2c and its description).

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Final Office Action, p. 4-5.

Shohara does not teach or suggest the method of claim 21. Shohara does not teach or suggest using first and second polarizations for communication circuits such that “first portions of communication areas for a *plurality* of different communication circuits use the same polarization to form communication region belts having the same polarization.” (Emphasis added) Again, the term plurality appears to be given no weight by the Examiner in applying the language of claim 21 to Shohara. Shohara does not use the same polarization in “communication region belts” formed by first portions of communication areas of a plurality of different communication circuits. Therefore, claim 21 is neither anticipated nor obvious in light of Shohara.

Shohara does not teach or suggest the system of claim 46. Shohara does not teach or suggest a communication system in which communication circuits use first and second polarizations such that “adjacent first portions of communication areas for a plurality of communication circuits use the same polarization to form communication region strips of the same polarization.” Therefore, claim 46 is neither anticipated nor obvious in light of Shohara.

Claims 22-30 and 47-54 depend from one of claims 21 and 46, respectively, and thus are likewise allowable.

iv. Claims 31-39

Claim 31 is directed to a method comprising forming boundaries between bands of communication regions by disposing a number of communication circuits and communicating using a first polarization in a first band. Further, the method includes communicating using a second polarization in bands that are adjacent to the first band.

In rejecting claim 31, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion, comprising forming boundaries between bands of communication regions by disposing a number of communication circuits (Figure 5, and its description); communicating using a first

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polarization in a first band (Figure 5, H2 horizontal polarization and its description); and communicating using a second polarization in bands that are adjacent region to the first band (Figure 5, elements 1b, 2c, V1 vertical polarization and its description).

Final Office Action, p. 5.

Shohara does not teach or suggest the method of claim 31. Shohara does not teach or suggest forming boundaries between bands of communication regions based on placement of communication circuits and communicating with a first polarization in a first band and a second polarization in adjacent bands. Therefore, claim 31 is neither anticipated nor obvious in light of Shohara.

Claims 32-39 depend from claim 31 and are thus likewise allowable.

v. Claims 40-45

Claim 40 is directed to a method comprising forming a number of communication areas, each communication area including a communication circuit. Each communication circuit communicates using a first polarization in a first portion of each communication area and a second polarization in a second portion of each communication area. The method further includes forming a number of communication regions in belts of either the first or second polarization wherein adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization. Further, the method includes forming a number of sectors within each communication area, where the first and second portions of the communication area are divided along a number of boundaries of the sectors, each sector communicating on a different subband of a frequency spectrum.

In rejecting claim 40, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion, comprising forming a number of communication areas, each communication area including a communication circuit, each communication circuit communicating a first polarization in a first portion of each communication area and a second polarization in a

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second portion of each communication area (Figure 1, Figure 2, element 2, Figure 5, H horizontal, V vertical and its description); forming a number of communication regions in belts of either the first or second polarization wherein adjacent portions of communication areas between different communication circuit use the same polarization (Figure 5, elements 1b, 2c and its description); and forming a number of sectors within each communication area wherein the first and second portions of communication area are divided along a number of boundaries of the sectors, each sector communicating on a different subband of frequency spectrum (Figure 5, elements 1a-d, and its description).

Final Office Action, p. 5-6.

Shohara does not teach or suggest the method of claim 40. Shohara does not teach or suggest “forming a number of communication regions in belts of either the first or second polarization wherein adjacent first portions of communication areas for a *plurality* of different communication circuits use the same polarization.” (Emphasis added). Therefore, claim 40 is neither anticipated nor obvious in light of Shohara.

Claims 41-45 depend from claim 40 and thus are likewise allowable.

vi. Claims 55-59

Claim 55 is directed to a communication system. The system includes a first plurality of communication circuits disposed in a first row. The system further includes a second plurality of communication circuits disposed in at least one additional row. The first plurality of communication circuits and the second plurality of communication circuits use a first polarization between the first row and at least one additional row. The first plurality of communication circuits and the second plurality of communication circuits use a second, different polarization for communications not between the first and at least one additional rows.

In rejecting claim 55, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion comprising a first plurality of communication circuits disposed in a first row (Figure 5, elements 1a-d, 2a-d, 3a-d and its

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description); a second plurality of communication circuits disposed in at least on additional row (Figure 5, elements 4a-d, 5a-d, 6a-d and its description); wherein the first plurality of communication circuits and the second plurality of communication circuits use a first polarization between first row and at least one additional row (Figure 5, 1a-d, 2a-d, H1, H2, 5a-d, 6a-d, H1, H2 and its description); wherein the first plurality of communication circuits and the second plurality of communication circuits use a second different polarization for communications not between the first and at least one additional rows (Figure 5, 1a-d, 2a-d, V1, V2, 4a-d, 5a-d, H1 H2 and its description).

Final Office Action, p. 6.

Shohara does not teach or suggest the system of claim 55. Shohara does not teach or suggest a system with a plurality of communication circuits in at least two rows that use one polarization between the rows and a different polarization for communication not between the rows. Therefore, claim 55 is neither anticipated nor obvious in light of Shohara.

Claims 56-59 depend from claim 55 and thus are likewise allowable.

vii. Claims 60-64

Claim 60 is directed to a communication system. The system includes a number of communication circuits disposed along a boundary between first and second substantially linear communication regions. Each communication circuit communicates with a first polarization in the first communication region on one side of the boundary and a second, different polarization in the second communication region on the other side of the boundary.

In rejecting claim 60, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion comprising a number of communication circuits disposed along a boundary first and second substantially linear communication regions (Figure 5, elements 4a-d, 5a-d, and its description); wherein each communication circuit communications with a first polarization in the first communication region on one side of the

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boundary and a second, different polarization in the second communication region on the other side of the boundary (Figure 5, elements 4a-d, 5a-d, V1, V2, H1, H2 and its description).

Final Office Action, p. 6-7.

Shohara does not teach or suggest the system of claim 60. Shohara does not teach or suggest a number of communication circuits disposed on a boundary that communicate with one polarization on one side of the boundary and a second, different polarization on the other side of the boundary. Therefore, claim 60 is neither anticipated nor obvious in light of Shohara.

Claims 61-64 depend from claim 60 and thus are likewise allowable.

viii. Claims 65-68

Claim 65 is directed to a method. The method includes disposing a plurality of communication circuits on a boundary between first and second regions, configuring each of the plurality of communication circuits to communicate using a first polarization in the first region, and configuring each of the plurality of communication circuits to communicate using a second, different polarization in the second region.

In rejecting claim 65, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion, comprising disposing a plurality of communication circuits on a boundary between first and second region (Figure 5, elements 4a-d, 5a-d, and its description); configuring each of the plurality of communication circuits to communicate using a first polarization in the first region (Figure 5, elements 4a-d, 5a-d, V1, V2 and its description); configuring each of the plurality of communication circuits to communicate using a second polarization in the second region (Figure 5, elements 4a-d, 5a-d, H1, H2 and its description).

Final Office Action, p. 7.

Shohara does not teach or suggest the method of claim 65. Shohara does not teach or suggest a system with a plurality of communication circuits disposed on a

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boundary between first and second regions with the communication circuits configured to communicate using a first polarization in one region and a second, different polarization on the other region. For example, the elements 4a-4d and 5a-5d identified by the Examiner use both vertical and horizontal polarization in each of the regions defined by the boundary on which these elements are disposed. Therefore, claim 65 is neither anticipated nor obvious in light of Shohara.

Claims 66-68 depend from claim 65 and thus are likewise allowable.

ix. Claims 69

Claim 69 is directed to a method. The method includes disposing a first plurality of communication circuits in a first row, disposing a second plurality of communication circuits in at least one additional row, configuring the first plurality of communication circuits and the second plurality of communication circuits to use a first polarization between the first row and the at least one additional row, and configuring the first plurality of communication circuits and the second plurality of communication circuits to use a second, different polarization for communications not between the first and at least one additional rows.

In rejecting claim 69, the Examiner asserts that:

Shohara discloses a DMA cellular radio system with a channel quality criterion, comprising disposing a first plurality of communication circuits in a first row (Figure 5, elements 4a-d, 5a-d, 6a-d, and its description); disposing a second plurality of communication circuits in a second row (Figure 5, elements 7a-d, 8a-d, 9a-d, and its description); configuring the first plurality of communication circuits and the second plurality of communication circuits to use a first polarization between the first row and the at least additional row (Figure 5, elements 4a-d, 5a-d, 8a-d, 9a-d, H1, H2 and its description); configuring the first plurality of communication circuits and the second plurality of communication circuits to use a second, different polarization for communications not between the first row and the at least additional row (Figure 5, elements 4a-d, 5a-d, 8a-d, 9a-d, V1, V2 and its description).

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Final Office Action, p. 7.

Shohara does not teach or suggest the method of claim 69. Shohara does not teach or suggest configuring a first plurality of communication circuits in a row and a second plurality of communication circuits in a second row to use a first polarization for communication between the rows and a second, different polarization not between the rows. The elements identified by the Examiner use both horizontal *and* vertical polarization both between and not between the rows. Therefore, claim 69 is neither anticipated nor obvious in light of Shohara.

10. Summary

Appellants have set forth reasons why the Examiner is incorrect in maintaining the rejections of the pending claims. Specifically, the Examiner has failed to set forth a prima facie case of anticipation or obviousness. The Shohara reference does not teach all the limitations in the pending independent and dependant claims. Appellant respectfully submits that, for the above reasons, Claims 1-69 are allowable over the cited art. Therefore, reversal of the Examiner's rejections is respectfully requested.

Respectfully submitted,

Date:

December 17, 2003



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Appendix 1

Claims on Appeal

1. A communication system comprising:
a number of communication circuits disposed to divide a region into communication areas;
wherein each communication circuit communicates using a first polarization in a first portion of its communication area and communicates using a second, different polarization in a second portion of its communication area; and
wherein adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization to form substantially linear communication regions of the same polarization.
2. The communication system of claim 1 wherein the communication circuits in adjacent communication areas transmit using the same polarization in the adjacent portions of their communication areas.
3. The communication system of claim 1 wherein the first polarization comprises horizontal polarization.
4. The communication system of claim 3 wherein the second polarization comprises vertical polarization.
5. The communication system of claim 1 wherein the first and second portion of each communication area comprises approximately one half of the communication area.

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6. The communication system of claim 1 further comprising a number of sectors within each communication area, each sector communicating on a subband of a frequency spectrum.
7. The communication system of claim 6 wherein each sector communicates on a different subband than the subband being communicated on by an adjacent sector.
8. The communication system of claim 6 wherein the first and second portions of the communication area are divided along a number of boundaries of the sectors.
9. The communication system of claim 1 wherein each communication circuit transmits signals using a first and second polarization.
10. The communication system of claim 1 wherein each communication circuit receives signals using a first and second polarization.
11. The communication system of claim 1 wherein each communication circuit transmits and receives signals using a first and second polarization.
12. A communication system comprising:
a number of communication circuits disposed to form substantially linear boundaries between communication regions; and
wherein the communication circuits use a first polarization in one of the communication regions and a second, different polarization for signals communicated in communication regions adjacent to the one of the communication regions.

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13. The communication system of claim 12 wherein the first polarization comprises horizontal polarization.

14. The communication system of claim 13 wherein the second polarization comprises vertical polarization.

15. The communication system of claim 12 wherein the communication circuits are disposed to form communication areas within the communication regions.

16. The communication system of claim 15 further comprising a number of sectors within each communication area, each sector communicating on a subband of a frequency spectrum.

17. The communication system of claim 16 wherein the boundaries between communication regions lay along a number of boundaries of the sectors.

18. The communication system of claim 12 wherein each communication circuit transmits signals using a first and second polarization.

19. The communication system of claim 12 wherein each communication circuit receives signals using a first and second polarization.

20. The communication system of claim 12 wherein each communication circuit transmits and receives signals using a first and second polarization.

21. A method comprising:

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dividing a region into a number of communication areas, each communication area including a communication circuit;

communicating using a first polarization in a first portion of each communication area;

communicating using a second polarization in a second portion of each

communication area; and

wherein adjacent first portions of communication areas for a plurality of

different communication circuits use the same polarization to form

communication region belts having the same polarization.

22. The method of claim 21 wherein the communicating includes using the same polarization for signals in adjacent communication areas.

23. The method of claim 21 wherein the first polarization comprises horizontal polarization.

24. The method of claim 23 wherein the second polarization comprises vertical polarization.

25. The method of claim 21 wherein the first and second portion of each communication area comprises approximately one half of the communication area.

26. The method of claim 21 further comprising dividing each communication area into a number of sectors, each sector communicating on a subband of a frequency spectrum.

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27. The method of claim 26 wherein the first and second portions of the communication area are divided along a number of boundaries of the sectors.
28. The method of claim 21 wherein the communicating consists of transmitting.
29. The method of claim 21 wherein the communicating consists of receiving.
30. The method of claim 21 wherein the communicating consists of transmitting and receiving.
31. A method comprising:
forming boundaries between bands of communication regions by disposing a number of communication circuits;
communicating using a first polarization in a first band; and
communicating using a second polarization in bands that are adjacent to the first band.
32. The method of claim 31 wherein the first polarization comprises a horizontal polarization.
33. The method of claim 32 wherein the second polarization comprises a vertical polarization.
34. The method of claim 31 further comprising forming communication areas by disposing the communication circuits within the communication regions.

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35. The method of claim 34 further comprising dividing each communication area into a number of sectors, each sector communicating on a subband of a frequency spectrum.

36. The method of claim 35 wherein the boundaries between communication regions lay along a number of boundaries of the sectors.

37. The method of claim 31 wherein the communicating consists of transmitting.

38. The method of claim 31 wherein the communicating consists of receiving.

39. The method of claim 31 wherein the communicating consists of transmitting and receiving.

40. A method comprising:

forming a number of communication areas, each communication area including a communication circuit, each communication circuit communicating using a first polarization in a first portion of each communication area and a second polarization in a second portion of each communication area;

forming a number of communication regions in belts of either the first or second polarization wherein adjacent first portions of communication areas for a plurality of different communication circuits use the same polarization; and

forming a number of sectors within each communication area, where the first and second portions of the communication area are divided along a number of boundaries of the sectors, each sector communicating on a different subband of a frequency spectrum.

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41. The method of claim 40 wherein the first polarization comprises horizontal polarization.
42. The method of claim 41 wherein the second polarization comprises vertical polarization.
43. The method of claim 40 wherein each sector subband is different than the subband being communicated on by an adjacent sector.
44. The method of claim 40 wherein the communicating consists of transmitting.
45. The method of claim 40 wherein the communicating consists of receiving.
46. A communication system comprising:
a number of communication circuits disposed to divide a region into communication areas;
wherein each communication circuit communicates using a first polarization in a first portion of its communication area and communicates using a second, different polarization in a second portion of its communication area; and
wherein adjacent first portions of communication areas for a plurality of communication circuits use the same polarization to form communication region strips of the same polarization.
47. The communication system of claim 46 wherein the first polarization comprises horizontal polarization.

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48. The communication system of claim 47 wherein the second polarization comprises vertical polarization.
49. The communication system of claim 46 wherein the first and second portion of each communication area comprises approximately one half of the communication area.
50. The communication system of claim 46 further comprising a number of sectors within each communication area, each sector communicating on a subband of a frequency spectrum.
51. The communication system of claim 50 wherein each sector communicates on a different subband than the subband being communicated on by an adjacent sector.
52. The communication system of claim 50 wherein the first and second portions of the communication area are divided along a number of boundaries of the sectors.
53. The communication system of claim 46 wherein each communication circuit transmits signals using a first and second polarization.
54. The communication system of claim 46 wherein each communication circuit receives signals using a first and second polarization.
55. A communication system, comprising:
a first plurality of communication circuits disposed in a first row;
a second plurality of communication circuits disposed in at least one additional row;

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wherein the first plurality of communication circuits and the second plurality of communication circuits use a first polarization between the first row and at least one additional row; and

wherein the first plurality of communication circuits and the second plurality of communication circuits use a second, different polarization for communications not between the first and at least one additional rows.

56. The communication system of claim 55, wherein the first polarization comprises horizontal polarization and wherein the second polarization comprises vertical polarization.

57. The communication system of claim 55, wherein each of the communication circuits transmits in an associated communication area, the communication area having a number of sectors, each sector using a subband of a frequency spectrum.

58. The communication system of claim 57, wherein each sector uses a different subband than the subband used by an adjacent sector.

59. The communication system of claim 57, wherein a first group of the number of sectors for each communication circuit uses the first polarization and a second group of the number of sectors for each communication circuit uses the second polarization.

60. A communication system, comprising:

a number of communication circuits disposed along a boundary between first and second substantially linear communication regions; and

wherein each communication circuit communicates with a first polarization in the first communication region on one side of the boundary and a second, different polarization in the second communication region on the other side of the boundary.

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61. The communication system of claim 60, wherein the first polarization comprises horizontal polarization and wherein the second polarization comprises vertical polarization.

62. The communication system of claim 60, wherein each of the communication circuits transmits in an associated communication area, the communication area having a number of sectors, each sector using a subband of a frequency spectrum.

63. The communication system of claim 62, wherein each sector uses a different subband than the subband used by an adjacent sector.

64. The communication system of claim 62, wherein a first group of the number of sectors for each communication circuit uses the first polarization and a second group of the number of sectors for each communication circuit uses the second polarization.

65. A method comprising:
disposing a plurality of communication circuits on a boundary between first and second regions;
configuring each of the plurality of communication circuits to communicate using a first polarization in the first region; and
configuring each of the plurality of communication circuits to communicate using a second, different polarization in the second region.

66. The method of claim 65, wherein disposing a plurality of communication circuits on a boundary comprises disposing the plurality of communications circuits in a substantially linear row.

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67. The method of claim 65, wherein configuring each of the plurality of communication circuits to communicate using a first polarization in the first region comprises configuring each of the plurality of communication circuits to communicate using one of horizontal polarization and vertical polarization in the first region.

68. The method of claim 67, wherein configuring each of the plurality of communication circuits to communicate using the second, different polarization in the second region comprises configuring each of the plurality of communication circuits to communicate using the other of horizontal polarization and vertical polarization in the second region.

69. A method, comprising:

disposing a first plurality of communication circuits in a first row;

disposing a second plurality of communication circuits in at least one additional row;

configuring the first plurality of communication circuits and the second plurality of communication circuits to use a first polarization between the first row and the at least one additional row; and

configuring the first plurality of communication circuits and the second plurality of communication circuits to use a second, different polarization for communications not between the first and at least one additional rows.